Claims

1. A sheet production apparatus comprising an extruder to extrude, in a sheet state, a thermoplastic resin having a melt specific resistance value of not less than 0.3×10^8 (Ω·cm) in a molten state, and a movable cooling member for cooling the molten sheet product extruded from the extruder, which has a constitution where a tape electrode having a thickness of 5 μm-200 μm and multiple protrusions having a protrusion amount of not less than 0.1 mm, which are formed in the tip portion, is installed along the contact point between the molten sheet product and the movable cooling member, and the molten sheet product is brought into static close contact with the movable cooling member by streamer corona discharge from the above-mentioned tape electrode to the molten sheet product, comprising a center support member to support the center of the tape electrode disposed at the above-mentioned center of the molten sheet product, said center of the tape electrode being stretched linearly along the width direction of the molten sheet product; an ear portion supporting member to support the ear portion of a tape electrode present at the both side portion sides of the above-mentioned molten sheet product, said ear portion being shifted to the downstream side in the molten sheet product transport direction from the center of the electrode; a pair of displacement amount adjusting mechanism to adjust the displacement amount of the ear portion of the electrode to the above-mentioned downstream side in the sheet transport direction; and a travel drive mechanism to run the tape electrode along the width direction of a molten sheet product by winding a tape electrode fed from a feed part formed in one side end part of the movable cooling member, at a take-up part formed in the other side end part of the movable cooling member.

2. The sheet production apparatus of claim 1, wherein the gap

between the tape electrode and the molten sheet product is set within the range of 0.5 mm - 10 mm.

3. The sheet production apparatus of claim 1 or 2, wherein the interval between adjacent protrusions is set to less than 5 times the above-mentioned gap between the tape electrode and the molten sheet product.

4. The sheet production apparatus described in any one of claims 1 to 3, wherein the length of the center of the electrode disposed linearly along the width direction of the molten sheet product changes in response to the width of the molten sheet product.

5. The sheet production apparatus described in any one of claims 1 to 4, wherein an insulator to prevent discharge from the ear portion of the tape electrode to the movable cooling member is installed between the ear portion of the electrode and the movable cooling member.

6. The sheet production apparatus described in any one of claims 1 to 5, wherein the tape electrode is run along the width direction of the molten sheet product with a tension applied to the tape electrode by the travel drive means within the range of 5%-95% of the cleavage strength.

7. A production method of a sheet, comprising an extrusion step to extrude, in a sheet state, a thermoplastic resin having a melt specific resistance value of not less than 0.3×10^8 (Ω·cm) in a molten state from an extruder, a cooling step to cool the molten sheet product extruded from the extruder by bringing the product into close contact with a movable cooling member, and a draw step to draw the sheet product after cooling, for bringing the molten sheet product into static close contact with the movable cooling member by performing

streamer corona discharge on the molten sheet product in the above-mentioned cooling step, from a tape electrode having a thickness of 5 μm-200 μm and multiple protrusions having a protrusion amount of not less than 0.1 mm, formed in the tip portion, which is installed along the contact point between the above-mentioned molten sheet product and the movable cooling member, wherein the center of the tape electrode disposed at the above-mentioned center of the molten sheet product is stretched linearly along the width direction of the molten sheet product, the ear portion of a tape electrode present at the both side portion sides of the above-mentioned molten sheet product is supported with said ear portion being shifted to the downstream side in the molten sheet product-transport direction from the center of the electrode and the above-mentioned streamer corona discharge is applied while running the tape electrode along the width direction of a molten sheet product by winding a tape electrode fed from a feed part formed in one side end part of the movable cooling member, at a take-up part formed in the other side end part of the movable cooling member.

8. A sheet production apparatus comprising an extruder to extrude, in a sheet state, a thermoplastic resin having a melt specific resistance value of not less than 0.3×10^8 ($\Omega \cdot$cm) in a molten state, a movable cooling member for cooling the molten sheet product extruded from the extruder, and an electrode disposed along the contact point between the molten sheet product and the movable cooling member, which has a constitution where the molten sheet product is brought into static close contact with the movable cooling member by streamer corona discharge from the above-mentioned tape electrode to the molten sheet product, comprising a static contact control means to control at least one of the control objects of an extrusion amount of the thermoplastic resin material extruded from the above-mentioned extruder, the

electric current flown from the above-mentioned electrode to the molten sheet product, the voltage to be applied to the electrode, the gap between the electrode and the movable cooling member or an installation position of the electrode and the like, in response to the take-up speed of the molten sheet product by the above-mentioned movable cooling member.

9. The sheet production apparatus of claim 8, which comprises a control using a static contact control means, by preparing a corresponding Table of a take-up speed of the molten sheet product and the optimal value of the control object, based on the experiments previously performed, and reading the optimal value of the control object corresponding to the take-up speed of the molten sheet product at the present time point from the corresponding Table.

10. A sheet production apparatus comprising an extruder to extrude, in a sheet state, a thermoplastic resin having a melt specific resistance value of not less than 0.3×10^8 (Ω•cm) in a molten state, a movable cooling member for cooling the molten sheet product extruded from the extruder, and an electrode disposed along the contact point between the molten sheet product and the movable cooling member, which has a constitution where the molten sheet product is brought into static close contact with the movable cooling member by streamer corona discharge from the above-mentioned tape electrode to the molten sheet product, comprising a voltage regulation means to control a voltage to be applied to the electrode, a current regulation means to control an energizing electric current from the above-mentioned electrode to the molten sheet product, and a control means to switch between a voltage regulation state by the above-mentioned voltage regulation means and a current regulation state by the current regulation means depending on the above-mentioned take-up speed of the molten sheet product by the movable cooling

member.

11. The sheet production apparatus of claim 10, wherein, when the take-up speed of the molten sheet product by a movable cooling member changes, a control state of the application voltage by the voltage regulation means is employed, and when the above-mentioned molten sheet product is taken up at a constant speed, a current regulation state by the current regulation means is employed.

12. A production method of a sheet, comprising an extrusion step to extrude, in a sheet state, a thermoplastic resin having a melt specific resistance value of not less than 0.3×10^8 (Ω·cm) in a molten state from an extruder, a cooling step to cool the molten sheet product extruded from the extruder by bringing the product into close contact with a movable cooling member, and a draw step to draw the sheet product after cooling, for bringing the molten sheet product into static close contact with the movable cooling member by performing streamer corona discharge on the molten sheet product in the above-mentioned cooling step, from an electrode installed along the contact point between the above-mentioned molten sheet product and the movable cooling member, wherein a current regulation to control the energizing electric current from the above-mentioned electrode to the molten sheet product is applied after voltage regulation to control the voltage applied to the above-mentioned electrode in the sheet production start time, and at the time point when the sheet shifts into a stationary production state.

13. A sheet production apparatus comprising an extruder to extrude, in a sheet state, a thermoplastic resin having a melt specific resistance value of not less than 0.3×10^8 (Ω·cm) in a molten state, a movable cooling member for cooling the molten sheet product extruded from the extruder, and a corona

discharge part for bringing the molten sheet product into static close contact with the movable cooling member by applying streamer corona discharge to a molten sheet product, wherein a tape electrode having a thickness of 5 μm-200 μm is formed in the above-mentioned corona discharge part, the tape electrode is installed along the vicinity of the contact point between the above-mentioned molten sheet product and the movable cooling member, the gap between the tape electrode and the molten sheet product is set within the range of 0.5 mm - 10 mm, multiple protrusions having a protrusion amount of not less than 0.1 mm are arranged along the direction perpendicular to the transport direction of the above-mentioned molten sheet product, on the tip of the above-mentioned tape electrode, and the interval between adjacent protrusions is set to less than 5 times the above-mentioned gap between the tape electrode and the molten sheet product.

14. The sheet production apparatus of claim 1, wherein dispersion in the protrusion amount of respective protrusions formed in the tape electrode is set to less than 0.2 mm.

15. The sheet production apparatus of claim 1 or 2, wherein an amount of misalignment between the contact point between the molten sheet product and the movable cooling member, and the installation position of the tape electrode in the sheet transport direction is set to less than 5 mm.

16. A sheet production method, comprising an extrusion step to extrude, in a sheet state, a thermoplastic resin having a melt specific resistance value of 0.3×10^8 (Ω·cm) in a molten state from an extruder, cooling the molten sheet product extruded from the extruder, by bringing the product into close contact with a movable cooling member, and a draw step to draw the sheet product after cooling, wherein a tape electrode having a thickness of 5 μm-200 μm is installed along the vicinity of the

contact point between the above-mentioned molten sheet product and the movable cooling member, and streamer corona discharge is applied to a molten sheet product in the above-mentioned cooling step from a corona discharge part wherein the gap between the tape electrode and the molten sheet product is set within the range of 0.5 mm - 10 mm, multiple protrusions having a protrusion amount of not less than 0.1 mm are arranged at the tip of the above-mentioned tape electrode, along the direction perpendicular to the transport direction of the above-mentioned molten sheet product, and the interval between adjacent protrusions is set to less than 5 times the above-mentioned gap between the tape electrode and the molten sheet product, whereby the molten sheet product is cooled by bringing the product into close contact with the movable cooling member.